In the Specification:

Please amend the following paragraphs:

[0001] Applicants hereby [[claims]] claim foreign priority benefits under U.S.C. §119 of Japanese Patent Application No. 2003-82021, filed on March 25, 2003, and the content of which is herein incorporated by reference.

[0004] Each lower [[journals are]] journal is supplied with oil from cylinder head side to lubricate interface between the lower journals and the camshaft. [[Such type]] It is also known that only one lower journal 3 [[is]] can be provided with oil and the oil is in turn provided to other lower journals via the camshaft 2. The cylinder head 1 is secured onto the cylinder body by head bolts (not shown) penetrating the cylinder head 1.

[0007] In Fig. 6, an upper end surface of the cylinder head is depicted by hatching. Numeral 4 shows the counterbore face for the head bolts which is [[at]] lower than the bearing surface 5. Numeral 7 shows a hole into which the head bolt is inserted. Numeral 8 shows a hole into which an injector is attached. Numeral 9 shows a female screw into which a bolt to secure the upper journal is engaged. X shows a hole for an inlet or exhaust valve stem.

[0013] According to a first aspect of the present invention there is provided a bearing structure for a camshaft comprising a lower journal for supporting the camshaft thereon, the lower journal being formed with a hole cutting off a part of a bearing surface of the lower journal, wherein a connecting part between the bearing surface and the hole is formed with a recess hollowed from the bearing surface so that a bottom surface of the recess is apart [[to apart]] from the bearing surface, and a part of an edge connecting the recess and the bearing surface to each other is elongated in a perpendicular direction to an axis of the bearing surface.

[0019] Preferably, the [[recess has a]] bottom surface [[connecting]] of the recess connects to the side surface.

[0024] Preferably, a width of the bearing surface (L1) is wider than a standard width (L2) such that the [[area]] areas of the bearing surface to be lost by providing the recess is compensated.

[0025] According to a second aspect of the present invention there is provided a bearing structure for a camshaft comprising a lower journal for supporting the camshaft thereon, the lower journal being formed with a counterbore cutting off a corner part of a bearing surface of the lower journal in an arc-of-circle like manner, wherein a connecting part between the bearing surface and the counterbore is formed with an approximately triangular recess hollowed from the bearing surface so that a bottom surface of the recess is apart [[to apart]] from the bearing surface, and an edge connecting the recess and the bearing surface to each other comprises a first edge being elongated in a perpendicular direction to an axis of the bearing surface, and a second edge being elongated in a parallel direction to the axis of the bearing surface.

[0029] Preferably, the [[recess has a]] bottom surface [[connecting]] of the recess connects to the side surface.

[0047] In detail, the basic configuration of the bearing surface 5 of the lower journal is approximately rectangular in plan view as shown in Fig.1A, and is semicircular in side view as shown in Fig.1B. As shown in Fig.1A, the counterbore 6 is formed at a corner part in plan view of the bearing surface 5. The counterbore 6 is formed at a region B where the surface of the camshaft moves downwardly, and is positioned at an end of the bearing surface 5 in its width (L1) direction. The counterbore 6 is offset relative to a center C5 of the width L1 of the bearing surface 5 in the axis direction of the bearing surface 5 at length S.

[0048] As also shown in Fig. 2, a recess 11 is formed in the connecting part between the counterbore 6 and the bearing surface 5. The recess [[6]] 11 is hollowed from the bearing surface 5 so that a bottom surface of the recess is apart [[to apart]] from the bearing surface 5 or the surface of the camshaft 2. The recess

11 is stepped down in parallel from the bearing surface 5 (i.e., from the surface of the camshaft 2) at a length of several mm (about 1 mm for example). A part of an edge connecting the recess 6 and the bearing surface 5 to each other comprises a first edge 11a elongated in the perpendicular direction to an axis of the bearing surface O5 (or elongated in a rotational direction A of the camshaft 2). A remaining part of the edge comprises a second edge 11b elongated in the parallel direction of the axis of the bearing surface O5 (or elongated in the direction perpendicular to the rotational direction A of the camshaft 2).

[0049] As shown in Fig 1A, the recess 11 is configured to be an approximately right-angled triangle. As shown in Figs. 2 and 3A-3D in detail, the recess 11 has a side surface 15 connecting to the bearing surface 5 and having a vertical length, and a bottom surface 16 connecting to the side surface 15 and being parallel to the bearing surface 5. The side surface 15 comprises a first side surface 15a involving the first edge 11a, a second side surface 15b involving the second edge 11b, and a curved side surface 19 connecting the first side surface 15a and the second side surface 15b to each other.

[0050] While Figs. 3A-3D representatively show sectional views around the second side surface 15b, the same structures are applicable to views around the first side surface 15a. As shown in Fig. 3A, the first side surface 15a and/or the second side surface 15b may be simply a flat plane perpendicular to the bearing surface 5. Optionally, as shown in Figs. 3B and 3C, the first side surface 15a and/or the second side surface 15b may have a ramp 17 crossing to the bearing surface 5 at an angle θ of less than 90° to the bearing surface 5. As shown in Fig. 3B, the ramp 17 may be provided in the whole of the first side surface 15a and/or the second side surface 15b. Or, as shown in Fig. 3C, the ramp 17 may be provided at only the top part of the first side surface 15a and/or the second side surface 15b. In this case the ramp 17 is made by chamfering. As shown in Fig. 3D, the first side surface 15a and/or the second side surface 15b may have a curved surface 18 crossing tangentially to the bearing surface 5. The curved surface 18 may be provided in either the whole or only the top part of the first side surface 15a and/or the second side surface 15b.

[0058] In the meantime, with regard to the bearing structure of the preferred embodiment, as the recess 11 is depressed in the lower journal 3, the bearing area contacting to the surface of the camshaft 2 becomes smaller at the area of the recess 11, compared to the bearing area of the conventional type not having the recess 11. This causes increase of bearing pressure. Therefore, in the preferred embodiment, the width of the bearing surface L1 is wider than that of the conventional type such that the lost area by providing recess 11 is compensated, in order to secure a same amount of bearing pressure. That is, a width L1 of a rib 12 (Fig.1A) formed with the bearing surface 5 in the preferred embodiment is wider than the standard width L2 of the rib 12 (Fig.8A) in the conventional type.

[0060] In light of the significance of the present invention, [[one which cuts off the bearing surface may be any holes]] the invention may be applied to any hole which cuts off a part of the bearing surface. Besides the counterbore 6 shown in the preferred embodiment, either a simple bolt hole or a sunk hole is applicable for example.